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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,484	04/14/2004	Johannes Leendert Willem Cornelis Den Boestert	TS1382 (US)	8133
23632 7590 02/09/2007 SHELL OIL COMPANY P O BOX 2463 HOUSTON, TX 772522463			EXAMINER BOYER, RANDY	
			ART UNIT 1764	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		02/09/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/825,484		DEN BOESTERT ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Randy Boyer		1764	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner:  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>14 April 2004</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Moller (WO 01/10540 A2).
3. With respect to claim 1, Moller discloses a process for separating contaminants from a mixture using a membrane having a feed side and a permeate side, by contacting the mixture with the feed side of the membrane, wherein between the feed side and permeate side of the membrane a pressure difference is applied, thereby passing part of the mixture from the feed side to the permeate side and obtaining at the permeate side of the membrane a permeate having a reduced content of contaminants (page 1, lines 2-7), and by removing the permeate from the permeate side of the membrane, wherein during selected time intervals the removal of permeate from the permeate side of the membrane is stopped (page 6, lines 9-13) so that the pressure difference over the membrane is substantially lowered (page 4, lines 31-33, and page 5, lines 1-3).

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4. With respect to claim 2, Moller discloses wherein the membrane comprises a top layer made of a dense membrane and a support layer made of a porous membrane (page 36, line 7).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 3-16 are rejected under 35 U.S.C. 103(a) over Moller (WO 01/10540 A2) in view of Cederlof (WO 03/035803 A1).

9. With respect to claim 3, Moller discloses a process for separating contaminants from a mixture using a membrane having a feed side and a permeate side, by contacting the mixture with the feed side of the membrane, wherein between the feed side and permeate side of the membrane a pressure difference is applied, thereby passing part of the mixture from the feed side to the permeate side and obtaining at the permeate side of the membrane a permeate having a reduced content of contaminants (see Moller, page 1, lines 2-7), and by removing the permeate from the permeate side of the membrane, wherein during selected time intervals the removal of permeate from the permeate side of the membrane is stopped (see Moller, page 6, lines 9-13) so that the pressure difference over the membrane is substantially lowered (see Moller, page 4, lines 31-33, and page 5, lines 1-3); and wherein the membrane comprises a top layer made of a dense membrane and a support layer made of a porous membrane (see Moller, page 36, line 7).

Moller does not disclose wherein the dense membrane is made from a polysiloxane.

However, Cederlof discloses a continuous process to separate color bodies and asphalthenic contaminants from a hydrocarbon mixture by passing part of the mixture through a polysiloxane membrane (see Cederlof, page 1, lines 1-7, and page 4, lines

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24-26). Cederlof explains that polysiloxane membranes are highly effective at removing contaminants and color bodies from a hydrocarbon mixture due to the membrane's ability to block the diffusion through of the high molecular weight and structurally complex contaminant particles (see Cederlof, page 4, lines 21-24).

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to substitute a polysiloxane membrane to the separation process disclosed by Moller in order to provide an effective means of removing color bodies and asphalthenic contaminants from a hydrocarbon mixture.

10. With respect to claim 4, Moller discloses wherein the pressure difference is lowered by at least 20% (see Moller, Figure 9).

11. With respect to claim 5, Cederlof discloses wherein the pressure difference across the membrane during separation is between 10 and 30 bar (see Cederlof, page 5, lines 21-23).

12. With respect to claim 6, Cederlof discloses wherein the pressure difference is lowered to 0 bar (see Cederlof, page 5, lines 23-26).

13. With respect to claim 7, Cederlof discloses wherein time periods of between 5 and 480 minutes of continuous separation across the membrane alternate with time intervals of between 1 and 60 minutes at which the pressure difference is substantially lowered (see Cederlof, page 6, lines 28-35, and page 7, lines 1-5).

14. With respect to claim 8, Cederlof discloses wherein the time interval at which the pressure difference is substantially lowered is below thirty minutes (see Cederlof, page 6, lines 34-35, and page 7, lines 1-5).

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15. With respect to claim 9, Moller discloses wherein the removal of permeate from the permeate side is stopped at regular intervals (see Moller, page 8, lines 22-26).

16. With respect to claim 10, Moller discloses wherein the permeate is removed from the permeate side of the membrane through a conduit including a permeate valve, which valve is closed during the selected time intervals so as to stop the removal of permeate (see Moller, page 6, lines 9-13, and Figure 1).

17. With respect to claims 11 and 12, Cederlof discloses wherein the membrane is operated at a temperature between 10°C and 100°C (see Cederlof, page 7, lines 6-8).

18. With respect to claim 13, Cederlof discloses wherein the hydrocarbon mixture has an initial boiling point greater than 20°C and 95% recovery point of less than 600°C, determined by ASTM D2887 (see Cederlof, page 3, lines 14-20).

19. With respect to claim 14, Cederlof discloses wherein the hydrocarbon mixture has an ASTM D1500 color index of above 2 (see Cederlof, page 2, lines 34-35, and page 3, lines 1-2).

20. With respect to claim 15, Cederlof discloses wherein the hydrocarbon mixture is a contaminated natural gas condensate or a contaminated refinery stream (see Cederlof, page 3, lines 20-23).

21. With respect to claim 16, Cederlof discloses wherein the hydrocarbon mixture is a liquid hydrocarbon feed from which light olefins are to be produced by thermal cracking, wherein the membrane forms part of a membrane separation unit in which the hydrocarbon permeate is removed from the permeate side of the membrane, and wherein a retentate is removed from the retentate side of the membrane, and wherein

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the process further comprises the steps of: (a) supplying the permeate to the inlet of a cracking furnace, allowing the permeate to crack in the coils of the cracking furnace in the presence of steam at elevated temperature and removing from the cracking furnace a cracked stream which is enriched in light olefins; (b) quenching the cracked stream; (c) supplying the cooled cracked stream to a fractionation column; (d) removing the retentate; and (e) removing from the top of the fractionation column a gaseous stream, from the side of the fractionation column a side stream of fuel oil components and from the bottom of the fractionation column a bottom stream (see Cederlof, page 12, lines 21-35, and page 13, lines 1-9).

### ***Conclusion***

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-7113. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.



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RPB

  
Supervisory Patent Examiner  
Technology Center 700